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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/550,689

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Katsumi Shibayama

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EXAMINER

MAI, ANH D

ART UNIT

PAPER NUMBER

2814

MAIL DATE

DELIVERY MODE

02/16/2010

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/550,689	Applicant(s) SHIBAYAMA, KATSUMI	
	Examiner Anh D. Mai	Art Unit 2814	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 January 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3-5,12 and 15-17 is/are pending in the application.
- 4a) Of the above claim(s) 1 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 3-5,12 and 15-17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Status of the Claims

1. Amendment filed September 9, 2009 is acknowledged. Claims 2, 6-11, 13 and 14 have been cancelled. Claims 1, 3, 4, 5 and 12 have been amended. Claims 15-17 have been added. Claims 1, 3-5, 12 and 15-17 are pending.
2. In response to the Restriction mailed December 4, 2009, Applicant elects without traverse of Species 2, as shown in Fig. 13B. Claims 3-5, 12 and 15-17 are identified to read on the elected Species 2.

Action on merits of claims 3-5, 12 and 15-17 follows.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claim 3 is rejected under 35 U.S.C. 102(b) as being anticipated by Sekine et al. (US Pub. No. 2002/0153492).

With respect to claim 3, Sekine teaches a photodiode array as claimed including a semiconductor substrate (70),

wherein a plurality of photodiodes (73) are formed in array on an opposite surface side to an incident surface of light to be detected, in the semiconductor substrate (70), and

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wherein a plurality depressions (72) with a predetermined depth more depressed than a region **not** corresponding to a region where the plurality of photodiodes (73) is formed, are formed in the respective regions corresponding to the respective photodiodes is formed, on a side of the incident surface of the light to be detected, in the semiconductor substrate (70), and

wherein adjacent depressions (72) are in communication with each other, in the semiconductor substrate (70). (See Figs. 21-22).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 4, 5, 12 and 15-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sekine '492 as applied to claim 3 above, and further in view of Yoneta et al. (US Pub. No. 2003/0034496) of record.

With respect to claim 4, Sekine teaches the photodiode array as described in claim 3 above including a semiconductor substrate (70), wherein the plurality of the photodiodes (73) are formed in array on the opposite to the incident surface of light to be detected, in the semiconductor substrate (70).

Thus, Sekine is shown to teach all the features of the claim with the exception of explicitly disclosing the semiconductor substrate is provided with an impurity region between the photodiodes adjacent to each other.

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However, Yoneta teaches a photodiode array including a plurality of photodiodes are formed in the semiconductor substrate (3), wherein the semiconductor substrate (3) is provided with an impurity region (6) between the photodiodes (4) adjacent to each other, for separating the photodiodes (4) from each other. (See Figs. 2-3).

Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention was made to form the photodiode of Sekine to include the impurity region between the photodiode adjacent each other as taught by Yoneta for separate the photodiodes from each other to prevent cross-talk between the adjacent photodiodes.

With respect to claims 5 and 15, in view of Yoneta, the photodiode further includes a high-impurity-concentration layer (8) of the same conductivity type (N) as the semiconductor substrate (3) is formed on the incident surface side of the light to be detected, in the semiconductor substrate (3).

With respect to claims 12, 16 and 17, the radiation detector of Sekine comprises the photodiode array as described in claims 3, 4 and 5 above and a scintillator panel (54) arranged opposite to the incident surface of the light to be detected in the photodiode array (73), and arranged to emit light with incidence of radiation. (See Fig. 22).

Response to Arguments

5. Applicant's arguments with respect to amended and new claims have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anh D. Mai whose telephone number is (571) 272-1710. The examiner can normally be reached on 8:00AM-5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on (571) 272-1705. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR

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system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Anh D. Mai/

Primary Examiner, Art Unit 2814